

TRIPLE-PHASE NANO-COMPOSITE STEELS

ABSTRACT OF THE DISCLOSURE

Carbon steels of high performance are disclosed that contain a three-phase microstructure consisting of grains of ferrite fused with grains that contain dislocated lath structures in which laths of martensite alternate with thin films of austenite. The microstructure can be formed by a unique method of austenization followed by multi-phase cooling in a manner that avoids bainite and pearlite formation and precipitation at phase interfaces. The desired microstructure can be obtained by casting, heat treatment, on-line rolling, forging, and other common metallurgical processing procedures, and yields superior combinations of mechanical and corrosion properties.

SF 1288718 v4